What is Best Evidence?

Robert F Raspa

CAPT MC USN

Naval Hospital, Jacksonville, FL

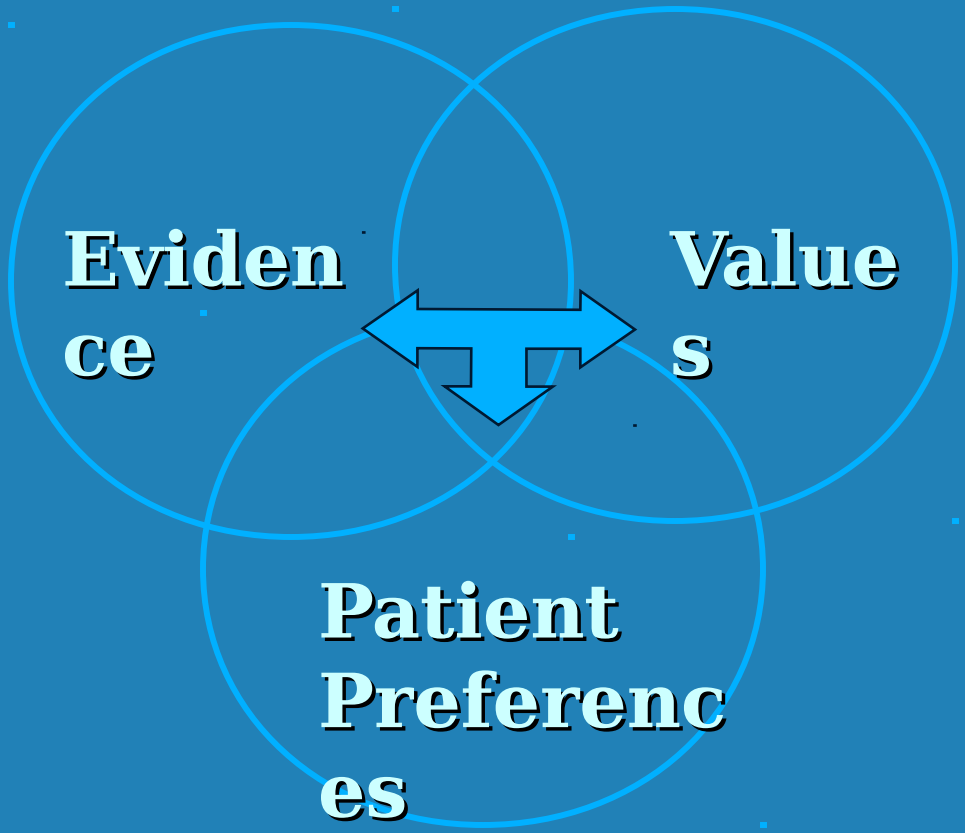
Objectives

- **Discuss the place of Best Evidence in Practice**
- **Explain the hierarchy of evidence**
- **Chose the best article for patient centered questions about treatment, diagnosis and prognosis**

Best Evidence Definition

- **I read it in the BMJ. . .**
- **Conscientious, explicit, judicious use of current best evidence in making decisions**

Best Evidence “Venn Diagram”



Patient Centered Evidence

- Begin with the patient
- **Functional status**
- **Mortality**
- **Quality of life**

Patient Centered Evidence

- **Not disease or lab-oriented:**
  - **cholesterol lowering**
  - **PVC eradication**
- **Not expert opinion or experienced based**
  - **May be outdated**
- **Not based on pathophysiology**
  - **fetal monitoring**

Evidence Based Practice

- **Forming a question**
- **Searching**
- **Validating evidence**
- **Putting evidence into practice**
- **Evaluating performance**

What kind of studies to look for?

- **Hierarchy of evidence**
- **Validity: type and quality of study**
- **Quality of recommendations: Grading**
  - **Sometimes burden of illness**
  - **Sometimes level II evidence**
  - **Sometimes benefit equals harm and data is insufficient**

Hierarchy of Evidence

I	Strong evidence from at least one systematic review of well designed RCTs
II	Strong evidence from at least one properly designed RCT of appropriate size
III	Evidence fm well designed trials w/o randomization: single group pre-post, cohort, case control
IV	Evidence from well designed non-experimental studies from > one center or research group
V	Opinions of respected authorities, based on clinical evidence, descriptive studies or reports of expert committees
VI	Someone once told me

Level	Type of Evidence
Ia	Evidence obtained from meta-analysis of randomised controlled trials.
Ib	Evidence obtained from at least one randomised controlled trial.
IIa	Evidence obtained from at least one well-designed controlled study without randomisation.
IIb	Evidence obtained from at least one other type of well-designed quasi-experimental study.
III	Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case control studies.
IV	Evidence obtained from expert committee reports or opinions

Grade	Recommendation
A (Evidence Levels Ia, Ib)	Required - at least one randomised controlled trial as part of the body of literature of overall good quality and consistency addressing specific recommendation
B (Evidence Levels IIa, IIb, III)	Required - availability of well conducted clinical studies but no randomised clinical trials on the topic of recommendation.
C (Evidence level IV)	Required - evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities. Indicates absence of directly applicable clinical studies of good quality

Appraising an article

- **Step I:**
  Screen for validity and relevance
- **Step II:**
  Determine intent of article
- **Step III:**
  Evaluate validity

Step I: Initial validity, relevance

- **Peer reviewed?**
- **Location of patients similar to mine--general or referred**
- **Funding influences study**
  - **New England Journal Reviews**
- **Problem common or important?**
- **Will it change my practice?**

Step II: Intent

- **Therapy**
- **Diagnosis/Screening**
- **Causation**
- **Prognosis**

Step III: Validity eval for Therapy

- **Randomized controlled trial?**
- **Patients properly randomized?**
- **Patients similar to mine?**

Step III: Validity eval for Therapy

- **All patients accounted for at conclusion?**
  - **Complete follow up--few lost compared with bad outcomes**
  - **Analyzed in groups they were initially randomized--intention to treat.**
- **Double-blinded?**

Step III: Validity eval for Therapy

- **Clinically as well as statistically significant results?**
- **If negative results, power analysis done?**
- **Do benefits outweigh harms and costs?**
- **Biases?**

Step III: Diagnosis Study

- **What is the disease and the test?**
- **Gold standard?**
- **Test compared to gold standard in a uniformly blind manner?**
- **Patient sample broad enough to generalize to clinical practice?**

Step III: Diagnosis Study

- **Test reasonable? What are its limitations?**
- **Participants similar to my patients? Prevalence affects positive predictive value**
- **Will test trigger therapy which works? Will my patients be better off?**

Step III: Cross Sectional Study

- **Prevalence study used for screening decisions**
- **Same rules as diagnostic studies but used for screening tests**
- **Still use 2 x 2 table**

Step III: "Causation Study"

- **Prospective cohort studies are best**
- **(Really need a randomized control trial)**
- **Case-control retrospective studies are often used (start with disease and work backward to risk factor)**

Step III: "Causation Study"

- **Defined comparison group for those at risk or having disease?**
- **Outcomes and exposures measured in the same way in groups being compared?**
- **Observers blinded to the exposure and to the outcome?**

Step III: "Causation Study"

- **Follow-up long enough and complete?**
- **Temporal relation correct? (Exposure precedes disease)**
- **Dose-response gradient?**
- **How strong an association between exposure and outcome? Large relative risk or odds ratio.**

Step III: Prognosis article

- **Inception cohort assembled? Specific group of people without outcome (or early in disease) selected and followed?**
- **Criteria for entry objective, reasonable and unbiased?**
- **Follow up of participants adequate? (70-80%)**

Step III: Prognosis article

- **Patients similar to mine in age, sex, race, severity of disease and other factors which may influence outcome?**
- **Where did participants come from? Referral pattern?**
- **Outcomes assessed objectively and blindly?**

Error

- **Type I: difference due to chance alone?**
  - **Usually due to flaws or biases.**
  - **Clinical as well as statistical significance**
- **Type II: If not significant (negative study) was a power analysis done to be sure it really wasn’t significant?**